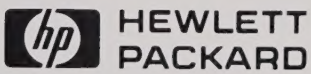
64000

# HP64000 Logic Development System

# Model 64502A Positive Prom Programmer Module



## CERTIFICATION

*Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Bureau of Standards, to the extent allowed by the Bureau's calibration facility, and to the calibration facilities of other International Standards Organization members.*

## WARRANTY

This Hewlett-Packard system product is warranted against defects in materials and workmanship for a period of 90 days from date of installation. During the warranty period, HP will, at its options, either repair or replace products which prove to be defective.

Warranty service of this product will be performed at Buyer's facility at no charge within HP service travel areas. Outside HP service travel areas, warranty service will be performed at Buyer's facility only upon HP's prior agreement and Buyer shall pay HP's round trip travel expenses. In all other cases, products must be returned to a service facility designated by HP.

For products returned to HP for warranty service. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

### LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

### EXCLUSIVE REMEDIES

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. HP SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

## ASSISTANCE

*Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.*

*For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.*

CW&A 2/81

Hewlett-Packard

Service Manual

Model 64502A

Positive Prom Programmer Module

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# SAFETY SUMMARY

***The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements.***

**GROUND THE INSTRUMENT.**

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor ac power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

**DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE.**

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

**KEEP AWAY FROM LIVE CIRCUITS.**

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

**DO NOT SERVICE OR ADJUST ALONE.**

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

**DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT.**

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification of the instrument. Return the instrument to a Hewlett-Packard Sales and Service Office for service and repair to ensure that safety features are maintained.

**DANGEROUS PROCEDURE WARNINGS.**

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

**WARNING**

**Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting.**

SS-1-1/76

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# Section I

## General Information

### 1-1. Introduction.

1-2. This manual contains technical information concerning the application, troubleshooting, replacing failed parts, and the theory-of-operation for the Model 64502A PROM Programmer Module as used in the 64000 Logic Development System. The module is shown in figure 1-1.

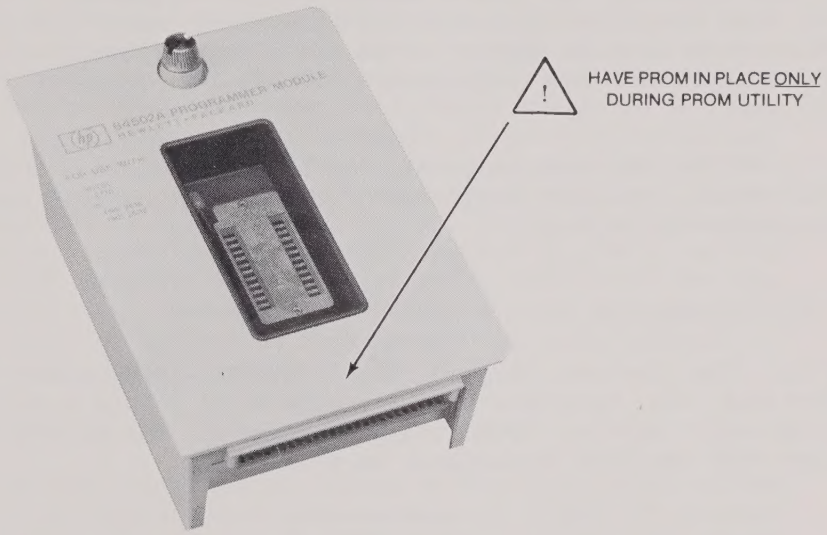



Figure 1-1. Model 64502A PROM Programmer Module

### 1-3. Safety Considerations.

1-4. There are no electrical shock hazards asssociated with the Model 64502A since there are no high voltages present. There are, however, high voltages associated with the 64100A Mainframe and appropriate warnings are given in the Mainframe Tab where these hazards exist.

### 1-5. Instruments Covered By This Manual.

1-6. This manual covers the model 64502A PROM Programmer Module with the 64502-66501 PC board installed.

1-7. An instrument manufactured after the printing of this manual may differ from the one described in this manual. The manual for this modified instrument is accompanied by a Manual Changes supplement. This supplement contains "change information" that explains how to adapt the manual to the modified instrument.

1-8. In addition to change information, the supplement will contain information for correcting errors in this manual. To keep this manual as current as possible, Hewlett-Packard recommends that you periodically request the latest manual changes supplement. The supplement for this manual is identified with the model number and manual print date both of which appear on the title page. Complimentary copies of the supplement are available from Hewlett-Packard Sales/Service Office.

1-9. For information concerning the applicability of this manual or the Manual Changes supplement, contact your nearest Hewlett-Packard Sales/Service Office.

1-10. Description.

1-11. The Hewlett Packard Model 64502A Programmer Module provides the interface between the Model 64501A Positive PROM Programmer and the PROM being programmed. The 64502A is also used with the PROM Performance Verification.

CAUTION

The 64502A is the only Module that should be used with PROM Programmer Performance Verification. Other Modules can be damaged!

1-12. The programmer module provides the reference for the adjustable regulators in the PROM Programmer, if they are used.

1-13. A module identification code is returned to the CPU, when requested by the CPU, to determine which PROM or PROMs may be programmed.

1-14. I.D. code for the Model 64502A is: 01 HEX (1 DEC).

1-15. The Model 64502A will program the following PROMs:

INTEL 2716, Texas Instruments TMS2516, and TMS2532. These PROMs contain all 1s (high state) in all memory locations after erasure.

# Section II

## Installation and Removal

2-1. Introduction.

2-2. This section contains information for installing and removing the Model 64502A. Included are initial inspection procedures and instruction for repacking the instrument for shipment.

2-3. Initial Inspection.

2-4. Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically Procedures for checking electrical performance are given in Section IV. If the contents are not complete, if there is mechanical damage or defect, or if the instrument does not pass the Performance Tests, notify the nearest Hewlett-Packard Office. If the shipping container is damaged, or if the cushioning material shows signs of stress, notify the carrier as well as the Hewlett-Packard Office. Keep the shipping materials for the carrier's inspection. The HP office will arrange for repair or replacement at HP's option so that there will be no waiting for the claim settelment.

2-5. Equipment Required.

2-6. The Programmer Module is installed in the front panel of the mainframe. If the system was purchased without a PROM Programmer Option, a blank Panel was installed in the opening. The blank panel or another PROM Programmer Module can be removed from the front panel without disassembling the mainframe. No tools are required for the installation or removal of the PROM Programmer.

NOTE

The Model 64502A Programmer Module must be installed and removed with the mainframe power turned off!

2-7. Removal

2-8. The blank panel or a Programmer Module can be removed by turning the thumb screw counter clockwise and lifting the panel or module out.

2-9. PROM Programmer Cable

2-10. A 50 conductor ribbon cable, W1, connects the PROM Programmer to the Programmer Module. The end of the cable with the single connector is connected to the PROM Programmer. The cable should be routed across the top of the card cage and down behind the front panel. The two connectors should be visible in the opening for the Programmer Module. Depending on the module being used, it can have one or two P.C. boards. If it has only one board, use the connector nearest the end of the cable. The P.C. boards and cable connectors are keyed and fit only one way.

2-11. Installation

2-12. To install the Programmer Module, follow the PROM Programmer cable procedure, then insert the module in the front panel of the mainframe, and tighten the thumb screw, turning it in the clockwise direction.

# Section III

## Operation

The 64502A Programmer Module operates in conjunction with the PROM Programmer. The total PROM Programmer is a function of the system software. Complete operation from the keyboard of the system is beyond the scope of the service manual. Please refer to the operator's manuals for the procedure.

**CAUTION**

The proper operation of the positve PROM programmer requires that a PROM be inserted ONLY AFTER the PROM programmer software module is called and that the PROM be REMOVED before the PROM programmer software module is exited.

NOTE

The PROM programmer software module is called by pressing the "prom_prog" softkey then press the carraige return key. To exit the PROM programmer software press the "end" softkey then the carraige return key.

# Section IV

## Performance Verification and Troubleshooting

For the details of this Performance Verificaton, see the service manual for the 64500S/64501A Positive PROM Programmer. This Programmer Module and the Positive PROM Programmer function as one unit and cannot operate by themselves.

**CAUTION**

The 64502A is the only module that should be used with PROM Programmer Performance Verification. Other modules can be damaged due to the +26 Volt DAC Test.

# Section V

## Adjustments

There are no adjustmens in this Module.

# Section VI

# Replaceable Parts

## 6-1. Introduction

6-2. This section contains information for ordering parts. Table 6-1 lists abbreviations used in the parts list and throughout the manual. Table 6-2 lists all replaceable parts in reference designator order. Table 6-3 contains the names and addresses that correspond to the manufacturers' five-digit code numbers.

## 6-3. Abbreviations

6-4. Table 6-1 lists abbreviations used in the parts list, the schematics and throughout the manual. In some cases, two forms of the abbreviation are used: one, all in capital letters; and two, partial or no capitals. This occurs because the abbreviations in the parts list are always capitals. However, in the schematics and other parts of the manual, other abbreviation forms are used with both lowercase and uppercase letters.

## 6-5. Replaceable Parts List

6-6. Table 6-2 is the list of replaceable parts and is organized as follows:

a. Chassis-mounted parts in alphanumerical order by referance designation.

b. Electrical assemblies and their components in alphanumerical order by referance designation.

c. Miscellaneous parts.

The information given for each part consists of the following:

a. The Hewlett-Packard part number and the check digit.

b. The total quantity (Qty) in the instrument.

c. The description of the part.

d. A five-digit code that indicates the manufacturer.

e. The manufacturers' part number.

The total quantity for each part is given only once - at the first appearance of the part number in the list.

6-7. Ordering Information

6-8. To order a part listed in the replaceable parts table, quote the Hewlett-Packard part number and check digit, indicate the quantity required, and address the order to the nearest Hewlett-Packard office.

6-9. To order a part that is not listed in the replaceable parts table, include the instrument model number, instrument repair number, the description and function of the part, and the number of parts required. Address the order to the nearest Hewlett-Packard office.

6-10. Direct Mail Order System

6-11. Within the USA, Hewlett-Packard can supply parts through a direct mail order system. Advantages of using the system are as follows:

a. Direct ordering and shipment from the HP Parts Center in Mountain View, California.

b. No Maximum or minimum on any mail order (there is a minimum order amount, for parts ordered through a local HP office when the orders require billing and invoicing).

c. Prepaid transportation (there is a small handling charge for each order).

d. No invoices - to provide these advantages, a check or money order must accompany each order.

6-12. Mail-order forms and specific ordering information are available through your local HP office. Addresses and phone numbers are located at the back of this manual.

# Table 6-1. Reference Designators and Abbreviations

## REFERENCE DESIGNATORS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | = assembly | F | = fuse | MP | = mechanical part | U | = integrated circuit |
| B | = motor | FL | = filter | P | = plug | V | = vacuum, tube, neon bulb, photocell, etc |
| BT | = battery | IC | = integrated circuit | Q | = transistor | | |
| C | = capacitor | J | = jack | R | = resistor | VR | = voltage regulator |
| CP | = coupler | K | = relay | RT | = thermistor | W | = cable |
| CR | = diode | L | = inductor | S | = switch | X | = socket |
| DL | = delay line | LS | = loud speaker | T | = transformer | Y | = crystal |
| DS | = device signaling (lamp) | M | = meter | TB | = terminal board | Z | = tuned cavity network |
| E | = misc electronic part | MK | = microphone | TP | = test point | | |

## ABBREVIATIONS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | = amperes | H | = henries | N/O | = normally open | RMO | = rack mount only |
| AFC | = automatic frequency control | HDW | = hardware | NOM | = nominal | RMS | = root-mean square |
| AMPL | = amplifier | HEX | = hexagonal | NPO | = negative positive zero (zero temperature coefficient) | RWV | = reverse working voltage |
| | | HG | = mercury | | | | |
| BFO | = beat frequency oscillator | HR | = hour(s) | | | | |
| BE CU | = beryllium copper | HZ | = hertz | NPN | = negative-positive-negative | S-B | = slow-blow |
| BH | = binder head | | | | | SCR | = screw |
| BP | = bandpass | | | NRFR | = not recommended for field replacement | SE | = selenium |
| BRS | = brass | IF | = intermediate freq | | | SECT | = section(s) |
| BWO | = backward wave oscillator | IMPG | = impregnated | NSR | = not separtely replaceable | SEMICON | = semiconductor |
| | | INCD | = incandescent | | | SI | = silicon |
| CCW | = counter-clockwise | INCL | = include(s) | | | SIL | = silver |
| CER | = ceramic | INS | = insulation(ed) | OBD | = order by description | SL | = slide |
| CMO | = cabinet mount only | INT | = internal | OH | = oval head | SPG | = spring |
| COEF | = coeficient | | | OX | = oxide | SPL | = special |
| COM | = common | K | = kilo=1000 | | | SST | = stainless steel |
| COMP | = composition | | | | | SR | = split ring |
| COMPL | = complete | LH | = left hand | P | = peak | STL | = steel |
| CONN | = connector | LIN | = linear taper | PC | = printed circuit | | |
| CP | = cadmium plate | LK WASH | = lock washer | PF | = picofarads= $10^{-12}$ farads | TA | = tantalum |
| CRT | = cathode-ray tube | LOG | = logarithmic taper | | | TD | = time delay |
| CW | = clockwise | LPF | = low pass filter | PH BRZ | = phosphor bronze | TGL | = toggle |
| | | | | PHL | = phillips | THD | = thread |
| DEPC | = deposited carbon | M | = milli= $10^{-3}$ | PIV | = peak inverse voltage | TI | = titanium |
| DR | = drive | MEG | = meg= $10^{6}$ | PNP | = positive-negative-positive | TOL | = tolerance |
| | | MET FLM | = metal film | | | TRIM | = trimmer |
| ELECT | = electrolytic | MET OX | = metallic oxide | P/O | = part of | TWT | = traveling wae tube |
| ENCAP | = encapsulated | MFR | = manufacturer | POLY | = polystyrene | | |
| EXT | = external | MHZ | = mega hertz | PORC | = porcelain | U | = micro = $10^{-6}$ |
| | | MINAT | = miniature | POS | = position(s) | | |
| F | = farads | MOM | = momentary | POT | = potentiometer | VAR | = variable |
| FH | = flat head | MOS | = metal oxide substrate | PP | = peak-to-peak | VDCW | = dc working volts |
| FIL H | = fillister head | MTG | = mounting | PT | = point | | |
| FXD | = fixed | MY | = "mylar" | PWV | = peak working voltage | W/ | = with |
| | | | | | | W | = watts |
| G | = giga ($10^{9}$) | N | = nano ($10^{-9}$) | RECT | = rectifier | WIV | = working inverse voltage |
| GE | = germanium | N/C | = normally closed | RF | = radio frequency | | |
| GL | = glass | NE | = neon | RH | = round head or right hand | WW | = wirewound |
| GRD | = ground(ed) | NI PL | = nickel plate | | | W/O | = without |

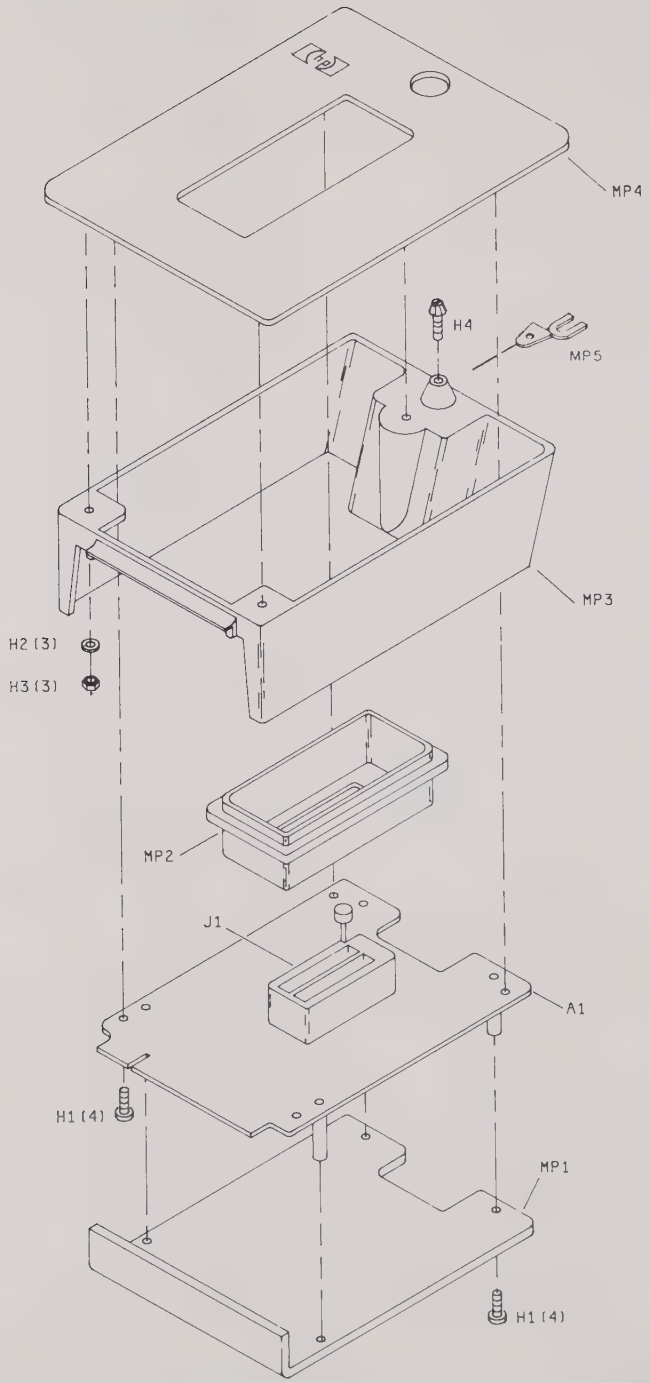



Figure 6-1. Model 64517A Illustrated Parts Breakdown

## Table 6-2. Replaceable Parts List

| Reference Designation | HP Part Number | C D | Qty | Description | Mfr Code | Mfr Part Number |
|---|---|---|---|---|---|---|
| | 64502-66501 | 1 | 1 | BOARD ASSEMBLY, PROGRAM MODULE | 28480 | 64502-66501 |
| C1 | 0160-3622 | 8 | 1 | CAPACITOR-FXD .1UF +80-20% 100VDC CER | 26654 | 2130Y5V100R104Z |
| H1 | 2360-0113 | 2 | 8 | SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI | 00000 | ORDER BY DESCRIPTION |
| H2 | 3050-0425 | 3 | 3 | WASHER-FL MTLC NO 4 125-IN-ID | 28480 | 3050-0425 |
| H3 | 2260-0009 | 3 | 3 | NUT-HEX-W/LKWR 4-40-THD 093-IN-THK | 28480 | 2260-0009 |
| H4 | 0570-0661 | 8 | 1 | SCREW-THUMB 6-32 .49-IN-LG | 28480 | 0570-0661 |
| J1 | 1200-0610 | 5 | 1 | SOCKET-IC-TB 24-CONT DIP TEST DIP-SLDR | 28480 | 1200-0610 |
| MP1 | 64500-04101 | 5 | 1 | SAFETY COVER | 28480 | 64500-04101 |
| MP2 | 64500-45204 | 5 | 1 | "BATHTUB" FOR ZIF SOCKET J1 | 28480 | 64500-45204 |
| MP3 | 5041-1576 | 0 | 1 | SUPPORT PANEL | 28480 | 5041-1576 |
| MP4 | 64502-00201 | 0 | 1 | FRONT PANEL | 28480 | 64502-00201 |
| MP5 | 64500-09101 | 2 | 1 | GROUND CLIP | 28480 | 64500-09101 |
| R1 | 0698-3402 | 1 | 1 | RESISTOR 316 1% .5W F TC=0+-100 | 28480 | 0698-3402 |
| R2 | 0757-0159 | 5 | 1 | RESISTOR 1K 1% .5W F TC=0+-100 | 28480 | 0757-0159 |
| R3 | 0757-0421 | 4 | 1 | RESISTOR 825 1% .125W F TC=0+-100 | 24546 | C4-1/8-T0-825R-F |
| R4 | 0698-3443 | 0 | 1 | RESISTOR 287 1% .125W F TC=0+-100 | 24546 | C4-1/8-T0-287R-F |
| R5 | 0757-0280 | 3 | 1 | RESISTOR 1K 1% .125W F TC=0+-100 | 24546 | C4-1/8-T0-1001-F |
| R6 | 0757-0417 | 8 | 1 | RESISTOR 562 1% .125W F TC=0+-100 | 24546 | C4-1/8-T0-562R-F |
| R7 | 0684-6801 | 1 | 1 | RESISTOR 68 10% .25W PC TC=-400/+500 | 01121 | CB6801 |
| R8 | 0684-1211 | 7 | 1 | RESISTOR 120 10% .25W PC TC=-400/+600 | 01121 | CB1211 |
| U1 | 1906-0074 | 1 | 2 | DIODE-ARRAY 50V 400MA | 28480 | 1906-0074 |
| U2 | 1810-0301 | 4 | 2 | NETWORK-RES 16-DIP$1.0 OHM X 8 | 01121 | 3168510 |
| U3 | 1820-1851 | 8 | 2 | IC 8HP-RGTR CMOS SYNCHRO POS-EDGE-TRIG | 04713 | 74LS148 |
| U4 | 1810-0301 | 4 | | NETWORK-RES 16-DIP$1.0 OHM X 8 | 01121 | 3168510 |
| U5 | 1906-0074 | 1 | | DIODE-ARRAY 50V 400MA | 28480 | 1906-0074 |
| U6 | 1820-1851 | 8 | | 8-LINE-TO-3 LINE OCTAL PRIORITY ENCODOR | 04713 | 74LS148 |
| U7 | 1820-1198 | 0 | 1 | IC GATE TTL LS NAND QUAD 2-INP | 01295 | SN74LS03N |
| U8 | 1810-0279 | 5 | 1 | NETWORK-RES 10-SIP4.7K OHM X 9 | 01121 | 210A472 |

See introduction to this section for ordering information

## Table 6-3. Manufacturers' Codes

| Mfr No. | Manufacturer Name | Address | | Zip Code |
|---|---|---|---|---|
| 00000 | ANY SATISFACTORY SUPPLIER | | | |
| 00480 | NORELCO NORTH AMER PHILIPS LTG CORP | LOS ANGELES | CA | 90021 |
| 01121 | ALLEN-BRADLEY CO | MILWAUKEE | WI | 53204 |
| 01295 | TEXAS INSTR INC SEMICOND CMPNT DIV | DALLAS | TX | 75222 |
| 01928 | RCA CORP SOLID STATE DIV | SOMERVILLE | NJ | 08876 |
| 03888 | KDI PYROFILM CORP | WHIPPANY | NJ | 07981 |
| 04713 | MOTOROLA SEMICONDUCTOR PRODUCTS | PHOENIX | AZ | 85062 |
| 07263 | FAIRCHILD SEMICONDUCTOR DIV | MOUNTAIN VIEW | CA | 94042 |
| 09023 | CORNELL-DUBILIER ELEK DIV FED PAC | SANFORD | NC | 27330 |
| 13103 | THERMALLOY CO | DALLAS | TX | 75234 |
| 19701 | MEPCO/ELECTRA CORP | MINERAL WELLS | TX | 76067 |
| 20940 | MICRO-OHM CORP | EL MONTE | CA | 91731 |
| 24546 | CORNING GLASS WORKS (BRADFORD) | BRADFORD | PA | 16701 |
| 26654 | VARADYNE INC | SANTA MONICA | CA | 90404 |
| 27014 | NATIONAL SEMICONDUCTOR CORP | SANTA CLARA | CA | 95051 |
| 27777 | VARO SEMICONDUCTOR INC | GARLAND | TX | 75040 |
| 28480 | HEWLETT-PACKARD CO CORPORATE HQ | PALO ALTO | CA | 94304 |
| 30983 | MEPCO/ELECTRA CORP | SAN DIEGO | CA | 92121 |
| 32997 | BOURNS INC TRIMPOT PROD DIV | RIVERSIDE | CA | 92507 |
| 34333 | MOTOROLA INC | FRANKLIN PARK | IL | 60131 |
| 34649 | INTEL CORP | MOUNTAIN VIEW | CA | 95051 |
| 56289 | SPRAGUE ELECTRIC CO | NORTH ADAMS | MA | 01247 |
| 71590 | CENTRALAB ELEK DIV GLOBE-UNION INC | MILWAUKEE | WI | 53201 |
| 72136 | ELECTRO MOTIVE CORP SUB IEC | WILLIMANTIC | CT | 06226 |
| 75042 | TRW INC PHILADELPHIA DIV | PHILADELPHIA | PA | 19108 |
| 75382 | KULKA ELECTRIC CORP | MT VERNON | NY | 10550 |
| 75915 | LITTELFUSE INC | DES PLAINES | IL | 60016 |

See introduction to this section for ordering information

# Section VII

## Manual Back Dating

This Section normally contains information for backdating this Manual. However, this instrument does not have Repair Numbers assigned to it; therefore, it is not possible to backdate to a previous instrument.

# Section VIII

## Theory and Schematics

8-1. Introduction.

8-2. This section contains information for troubleshooting and repairing the Model 64502A Programmer Module.

8-3. Block diagrams, schematics, component locators, and other service information are provided on fold-out Service Sheets in this section to help you in servicing the 64502A.

8-4. The basic operation of the 64502A is as follows:

a. The PROM Programmer is initiated by pressing the "prom_prog" softkey and then the carraige return key.

b. The PROM Programmer I.D. (01 HEX) is output to the CPU. The CPU translates this information onto the screen as "Prom Programmer Utility" and will ask for one of the four Prom types that can be used.

c. Select the Prom to be used by pressing one of the four Prom select softkeys and then the carraige return.

d. The softkeys will now display all the functions available to the user.

8-5. General Programming Sequence.

8-6. The program sequence is as follows:

NOTE: The mainframe's software controls the sequence of steps to program the Prom.

a. The starting address is output thru the Prom Controller PC board to the Prom on Address lines A11-A0.

b. Data is then placed out on Data lines D7-D0 from lines DW7-DW0 via the Prom Controller PC board.

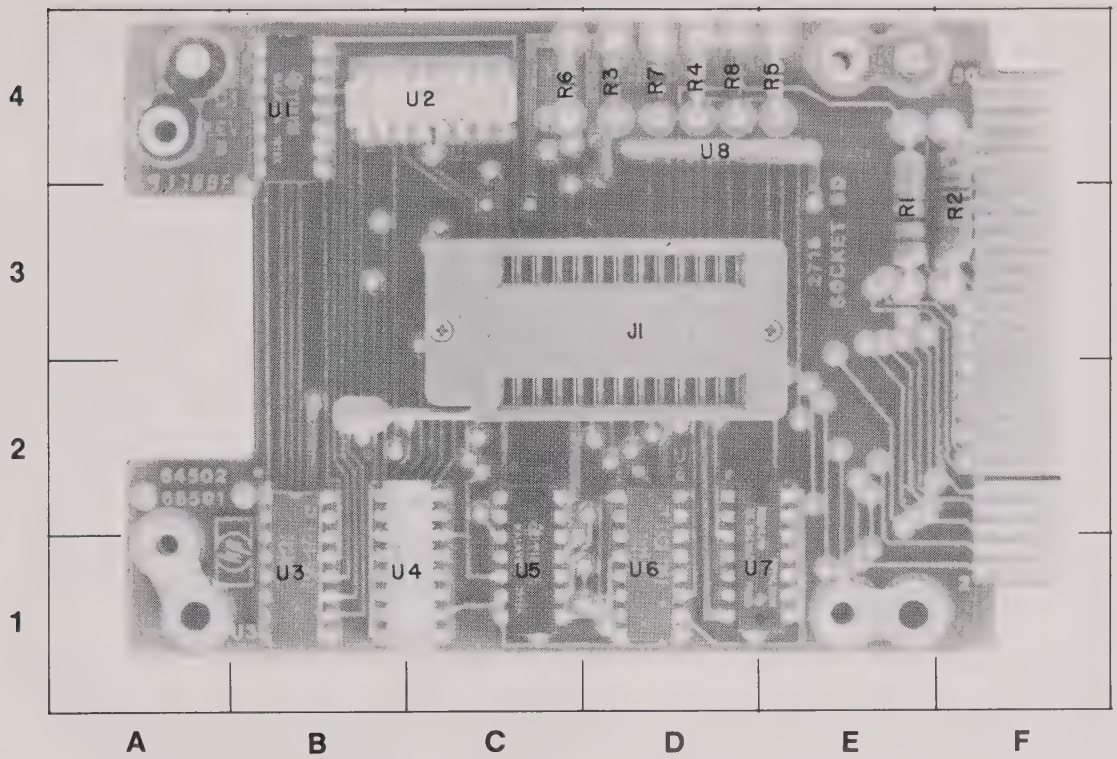
c. VP3 will then be raised to +25 volts. When PGM (from A15) is pulsed high (+5V for 50 milliseconds), the data is programmed into the addressed location.

d. PGM is lowered. The address is incremented and steps b thru d are repeated until the Prom has been fully programmed.

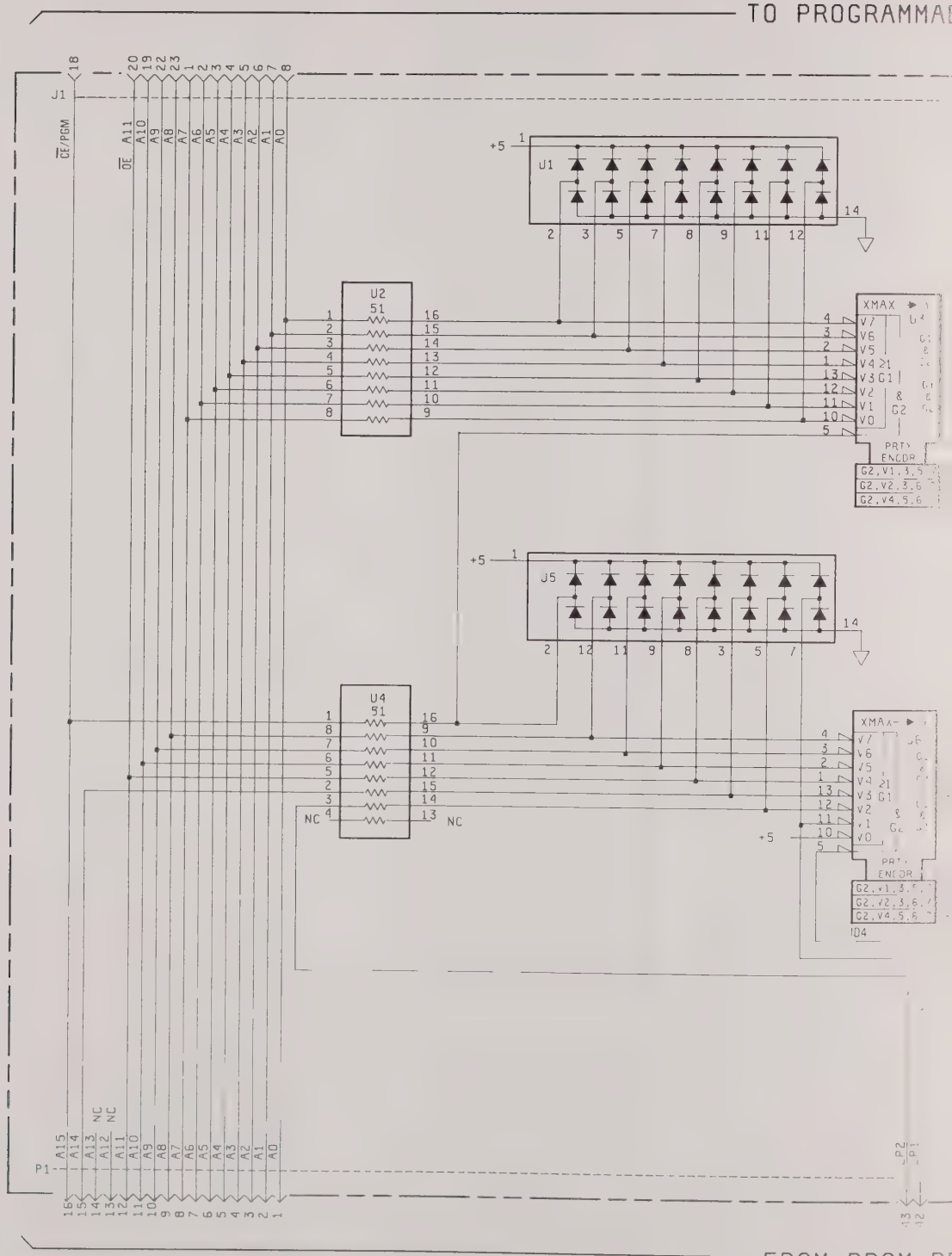
8-7. Performance Verification Components

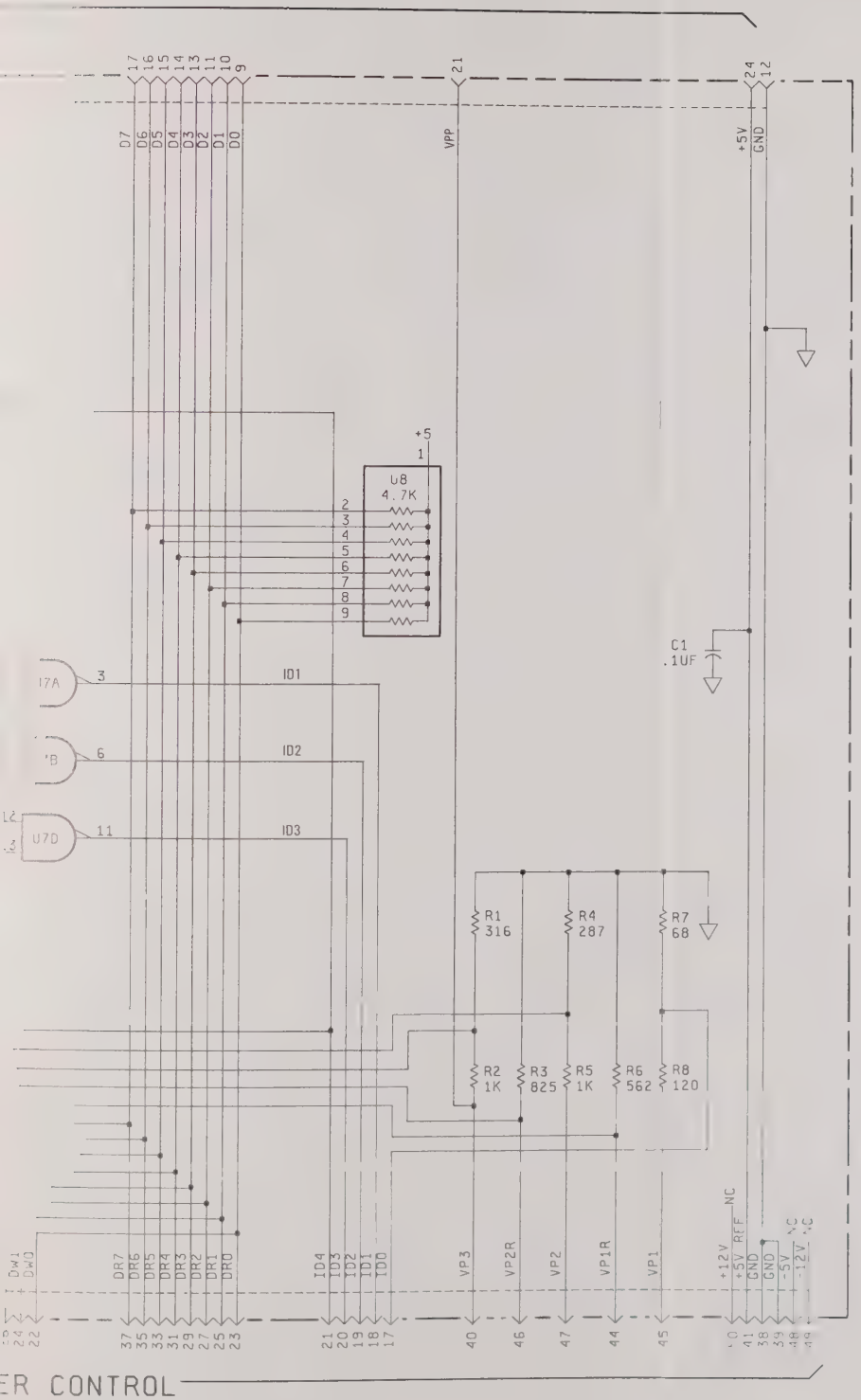
8-8. U3 and U6 are Priority Encoders used in conjunction with U7. These ICs produce codes in response to stimulus from the CPU during the Prom Programmer Performance Verification. The codes are returned to the CPU for verification over the programmer module's identification lines (ID4-ID0), through the PROM Programmer to the CPU data bus.

8-9. R1-R7 make up a series of voltage dividers. LP1 and LP2 are control voltages which are fed to VPR1 and VPR2 . The voltage at VP1 and VP2 is always +1.2V greater than the voltage at VPR1 and VPR2 respectively. The output of VP1 and VP2 is fed to the ID lines. During Performance Verification the ID lines (ID4-ID0) are read, thus checking both the address lines and supply voltages.




| REF DESIG | GRID LOC |
|---|---|
| J1 | 3-D |
| R1 | 3-E |
| R2 | 3-F |
| R3 | 4-D |
| R4 | 4-D |
| R5 | 4-E |
| R6 | 4-C |
| R7 | 4-D |
| R8 | 4-D |
| U1 | 4-B |
| U2 | 4-C |
| U3 | 1-B |
| U4 | 1-C |
| U5 | 1-C |
| U6 | 1-D |
| U7 | 1-D |
| U8 | 4-D |


TO PROGRAMMA
J1
CE/PGM
OE
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
+5
U1
U2
51
U4
J5
XMAX
PRTY ENCDR
G2,V1,3,5
G2,V2,3,6
G2,V4,5,6
NC
P1
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
FROM PROM P




**ICS ON THIS SCHEMATIC**

| REF. DES. | HP PART NO. | MFG. PART NO. |
|---|---|---|
| U3,6 | 1820-1851 | 74LS148 |
| U7 | 1820-1198 | 74LS03 |

**PARTS ON THIS SCHEMATIC**

C1
R1-8
U1-7

**IC POWER SUPPLY CONFIGURATIONS**

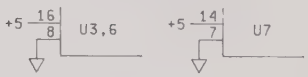



Figure
Scher
Prog Mo

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## Arranged alphabetically by country



### uct Line Sales/Support Key

oduct Line
nalytical
mponents
mputer Systems Sales only
mputer Systems Hardware Sales and Services
mputer Systems Software Sales and Services
ectronic Instruments & Measurement Systems
edical Products
edical Products Primary SRO
edical Products Secondary SRO
rsonal Computation Products
les only for specific product line
pport only for specific product line

**TANT: These symbols designate general product line capability. They do not sales or support availability for all products within a line, at all locations. t your local sales office for information regarding locations where HP t is available for specific products.**

*tributors are printed in italics.*

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*d*
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17595 BIONAR
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*n S.A.C.I.M. e I.*
*seo Colon 221, Piso 9*
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62650
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*Connaught Road, C.*
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*Tel: 682547*
*Telex: 031-2463*
*Cable: BLUESTAR*
*A,CH*,CM,CS*,E,M*

*Blue Star Ltd.*
*15/16:C Wellesley Rd.*
***PUNE** 411 011*
*Tel: 22775*
*Cable: BLUE STAR*
*A*

*Blue Star Ltd.*
*2-2-47/1108 Bolarum Rd.*
***SECUNDERABAD** 500 003*
*Tel: 72057*
*Telex: 0155-459*
*Cable: BLUEFROST*
*A,E*

*Blue Star Ltd.*
*T.C. 7/603 Poornima*
*Maruthankuzhi*
***TRIVANDRUM** 695 013*
*Tel: 65799*
*Telex: 0884-259*
*Cable: BLUESTAR*
*E*

*Computer Maintenance Corp*
*Ltd.*
*115, Sarojini Devi Road*
***SECUNDERABAD** 500 003*
*Tel: 310-184, 345-774*
*Telex: 031-2960*
*CH**

### INDONESIA

*BERCA Indonesia P.T.*
*P.O.Box 496/JKT.*
*Jl. Abdul Muis 62*
***JAKARTA***
*Tel: 373009*
*Telex: 46748 BERSAL IA*
*Cable: BERSAL JAKARTA*
*P*

*BERCA Indonesia P.T.*
*P.O.Box 2497/Jkt Antara Bl*
*17th Floor*
*Jl. Medan Merdeka Selatan*
***JAKARTA-PUSAT***
*Tel: 21-344-181*
*Telex: BERSAL IA*
*A,CS,E,M*

*BERCA Indonesia P.T.*
*P.O. Box 174/SBY.*
*Jl. Kutei No. 11*
***SURABAYA***
*Tel: 68172*
*Telex: 31146 BERSAL SB*
*Cable: BERSAL-SURABAYA*
*A*,E,M,P*

### IRAQ

Hewlett-Packard Trading S.A
Service Operation
Al Mansoor City 9B/3/7
**BAGHDAD**
Tel: 551-49-73
Telex: 212-455 HEPAIRAQ I
CH,CS

# SALES & SUPPORT OFFICES

## Arranged alphabetically by country

**LAND**
lett-Packard Ireland Ltd.
43 Lower Leeson Street
LIN 2
(1) 60 88 00
x: 30439
I,CM,CS,E,M,P
*liac Services Ltd.*
*ore Road*
*ne*
*LIN 5*
*(01) 351820*
*x: 30439*

**RAEL**
*n Electronic Instrument Ltd.*
*Box 1270*
*USALEM 91000*
*Ohaliav St.*
*USALEM 94467*
*533 221, 553 242*
*x: 25231 AB/PAKRD IL*

*tronics Engineering Division*
*orola Israel Ltd.*
*Kremenetski Street*
*Box 25016*
*AVIV 67899*
*3-338973*
*x: 33569 Motil IL*
*e: BASTEL Tel-Aviv*
*M,CS,E,M,P*

**ALY**
lett-Packard Italiana S.p.A
ersa 99C
Giulio Petroni, 19
124 **BARI**
(080) 41-07-44

lett-Packard Italiana S.p.A.
Martin Luther King, 38/111
132 **BOLOGNA**
(051) 402394
x: 511630
E,MS

lett-Packard Italiana S.p.A.
Principe Nicola 43G/C
126 **CATANIA**
(095) 37-10-87
x: 970291

lett-Packard Italiana S.p.A.
G. Di Vittorio 9
063 **CERNUSCO SUL NAVIGLIO**
(2) 903691
x: 334632
H,CM,CS,E,MP,P

lett-Packard Italiana S.p.A.
Nuova San Rocco a
odimonte, 62/A
131 **NAPLES**
(081) 7413544
x: 710698
H,E

lett-Packard Italiana S.p.A.
e G. Modugno 33
156 **GENOVA PEGLI**
(010) 68-37-07
x: 215238

lett-Packard Italiana S.p.A.
Turazza 14
100 **PADOVA**
(049) 664888
x: 430315
H,E,MS

lett-Packard Italiana S.p.A.
e C. Pavese 340
144 **ROMA**
(06) 54831

Hewlett-Packard Italiana S.p.A.
Corso Svizzera, 184
I-10149 **TORINO**
Tel: (011) 74 4044
Telex: 221079
CH,E

**JAPAN**
Yokogawa-Hewlett-Packard Ltd.
152-1, Onna
000 **ATSUGI**, Kanagawa, 243
Tel: (0462) 28-0451
CM,C*,E

Yokogawa-Hewlett-Packard Ltd.
Towa Building
2-3, Kaigan-dori, 2 Chome Chuo-ku
**KOBE**, 650
Tel: (078) 392-4791
C,E

Yokogawa-Hewlett-Packard Ltd.
Kumagaya Asahi 82 Bldg
3-4 Tsukuba
**KUMAGAYA**, Saitama 360
Tel: (0485) 24-6563
CH,CM,E

Yokogawa-Hewlett-Packard Ltd.
Asahi Shinbun Daiichi Seimei Bldg.
4-7, Hanabata-cho
**KUMAMOTO**,860
Tel: (0963) 54-7311
CH,E

Yokogawa-Hewlett-Packard Ltd.
Shin-Kyoto Center Bldg.
614, Higashi-Shiokoji-cho
Karasuma-Nishiiru
Shiokoji-dori, Shimogyo-ku
**KYOTO**, 600
Tel: 075-343-0921
CH,E

Yokogawa-Hewlett-Packard Ltd.
Mito Mitsui Bldg
4-73, Sannomaru, 1 Chome
**MITO**, Ibaragi 310
Tel: (0292) 25-7470
CH,CM,E

Yokogawa-Hewlett-Packard Ltd.
Sumitomo Seimei 14-9 Bldg.
Meieki-Minami, 2 Chome
Nakamura-ku
**NAGOYA**, 450
Tel: (052) 571-5171
CH,CM,CS,E,MS

Yokogawa-Hewlett-Packard Ltd.
Chuo Bldg.,
4-20 Nishinakajima, 5 Chome
Yodogawa-ku
**OSAKA**, 532
Tel: (06) 304-6021
Telex: YHPOSA 523-3624
A,CH,CM,CS,E,MP,P*

Yokogawa-Hewlett-Packard Ltd.
27-15, Yabe, 1 Chome
**SAGAMIHARA** Kanagawa, 229
Tel: 0427 59-1311

Yokogawa-Hewlett-Packard Ltd.
Daiichi Seimei Bldg.
7-1, Nishi Shinjuku, 2 Chome
Shinjuku-ku,**TOKYO** 160
Tel: 03-348-4611-5
CH,E

Yokogawa-Hewlett-Packard Ltd.
29-21 Takaido-Higashi, 3 Chome
Suginami-ku **TOKYO** 168
Tel: (03) 331-6111
Telex: 232-2024 YHPTOK
A,CH,CM,CS,E,MP,P*

Yokogawa-Hewlett-Packard Ltd.
Daiichi Asano Building
2-8, Odori, 5 Chome
**UTSUNOMIYA**, Tochigi 320
Tel: (0286) 25-7155

Yokogawa-Hewlett-Packard Ltd.
Yasuda Seimei Nishiguchi Bldg.
30-4 Tsuruya-cho, 3 Chome
**YOKOHAMA**221
Tel: (045) 312-1252
CH,CM,E

**JORDAN**
*Mouasher Cousins Company*
*P.O. Box 1387*
***AMMAN***
*Tel: 24907, 39907*
*Telex: 21456 SABCO JO*
*CH,E,M,P*

**KENYA**
*ADCOM Ltd., Inc., Kenya*
*P.O.Box 30070*
***NAIROBI***
*Tel: 331955*
*Telex: 22639*
*E,M*

**KOREA**
*Samsung Electronics Computer Division*
*76-561 Yeoksam-Dong*
*Kwangnam-Ku*
*C.P.O. Box 2775*
***SEOUL***
*Tel: 555-7555, 555-5447*
*Telex: K27364 SAMSAN*
*A,CH,CM,CS,E,M,P*

**KUWAIT**
*Al-Khaldiya Trading & Contracting*
*P.O. Box 830 Safat*
***KUWAIT***
*Tel: 42-4910, 41-1726*
*Telex: 22481 Areeg kt*
*CH,E,M*

*Photo & Cine Equipment*
*P.O. Box 270 Safat*
***KUWAIT***
*Tel: 42-2846, 42-3801*
*Telex: 22247 Matin kt*
*P*

**LEBANON**
*G.M. Dolmadjian*
*Achrafieh*
*P.O. Box 165.167*
***BEIRUT***
*Tel: 290293*
*MP**

**LUXEMBOURG**
Hewlett-Packard Belgium S.A./N.V.
Blvd de la Woluwe, 100
Woluwedal
B-1200 **BRUSSELS**
Tel: (02) 762-32-00
Telex: 23-494 paloben bru
A,CH,CM,CS,E,MP,P

**MALAYSIA**
Hewlett-Packard Sales (Malaysia) Sdn. Bhd.
1st Floor, Bangunan British American
Jalan Semantan, Damansara Heights
**KUALA LUMPUR** 23-03
Tel: 943022
Telex: MA31011
A,CH,E,M,P*

*Protel Engineering*
*P.O.Box 1917*
*Lot 6624, Section 64*
*23/4 Pending Road*
*Kuching,* ***SARAWAK***
*Tel: 36299*
*Telex MA 70904 PROTEL*
*Cable: PROTELENG*
*A,E,M*

**MALTA**
*Philip Toledo Ltd.*
*Notabile Rd.*
***MRIEHEL***
*Tel: 447 47, 455 66*
*Telex: Media MW 649*
*P*

**MEXICO**
Hewlett-Packard Mexicana, S.A. de C.V.
Av. Periferico Sur No. 6501
Tepepan, Xochimilco
**MEXICO D.F.** 16020
Tel: 676-4600
Telex: 17-74-507 HEWPACK MEX
A,CH,CS,E,MS,P

Hewlett-Packard Mexicana, S.A. de C.V.
Ave. Colonia del Valle #409
Col. del Valle
Municipio de Garza Garcia
**MONTERREY**, N.L.
Tel: 78 42 41
Telex: 038 410
CH

*ECISA*
*José Vasconcelos No. 218*
*Col. Condesa Deleg. Cuauhtémoc*
***MEXICO** D.F. 06140*
*Tel: 553-1206*
*Telex: 17-72755 ECE ME*
*M*

**MOROCCO**
*Dolbeau*
*81 rue Karatchi*
***CASABLANCA***
*Tel: 3041-82, 3068-38*
*Telex: 23051, 22822*
*E*

*Gerep*
*2 rue d'Agadir*
*Boite Postale 156*
***CASABLANCA***
*Tel: 272093, 272095*
*Telex: 23 739*
*P*

**NETHERLANDS**
Hewlett-Packard Nederland B.V.
Van Heuven Goedhartlaan 121
NL 1181KK **AMSTELVEEN**
P.O. Box 667
NL 1180 AR **AMSTELVEEN**
Tel: (020) 47-20-21
Telex: 13 216 HEPA NL
A,CH,CM,CS,E,MP,P

Hewlett-Packard Nederland B.V.
Bongerd 2
NL 2906VK **CAPELLE, A/D IJSSEL**
P.O. Box 41
NL 2900AA **CAPELLE, A/D IJSSEL**
Tel: (10) 51-64-44
Telex: 21261 HEPAC NL
A,CH,CS,E

**NEW ZEALAND**
Hewlett-Packard (N.Z.) Ltd.
169 Manukau Road
P.O. Box 26-189
Epsom, **AUCKLAND**
Tel: 687-159
Cable: HEWPACK Auckland
CH,CM,E,P*

Hewlett-Packard (N.Z.) Ltd.
4-12 Cruickshank Street
Kilbirnie, **WELLINGTON 3**
P.O. Box 9443
Courtenay Place, **WELLINGTON 3**
Tel: 877-199
Cable: HEWPACK Wellington
CH,CM,E,P

*Northrop Instruments & Systems Ltd.*
*369 Khyber Pass Road*
*P.O. Box 8602*
***AUCKLAND***
*Tel: 794-091*
*Telex: 60605*
*A,M*

*Northrop Instruments & Systems Ltd.*
*110 Mandeville St.*
*P.O. Box 8388*
***CHRISTCHURCH***
*Tel: 486-928*
*Telex: 4203*
*A,M*

*Northrop Instruments & Systems Ltd.*
*Sturdee House*
*85-87 Ghuznee Street*
*P.O. Box 2406*
***WELLINGTON***
*Tel: 850-091*
*Telex: NZ 3380*
*A,M*

**NORTHERN IRELAND**

**See United Kingdom**

**NORWAY**
Hewlett-Packard Norge A/S
Folke Bernadottes vei 50
P.O. Box 3558
N-5033 **FYLLINGSDALEN** (Bergen)
Tel: (05) 16-55-40
Telex: 16621 hpnas n
CH,CS,E,MS

Hewlett-Packard Norge A/S
Österndalen 18
P.O. Box 34
N-1345 **ÖSTERÅS**
Tel: (02) 17-11-80
Telex: 16621 hpnas n
A,CH,CM,CS,E,M,P

**OMAN**
*Khimjil Ramdas*
*P.O. Box 19*
***MUSCAT***
*Tel: 722225, 745601*
*Telex: 3289 BROKER MB MUSCAT*
*P*

*Suhail & Saud Bahwan*
*P.O.Box 169*
***MUSCAT***
*Tel: 734 201-3*
*Telex: 3274 BAHWAN MB*

**PAKISTAN**
*Mushko & Company Ltd*
*1-B, Street 43*
*Sector F-8/1*
***ISLAMABAD***
*Tel: 26875*
*Cable: FEMUS Rawalpindi*
*A,E,M*

*Mushko & Company Ltd.*
*Oosman Chambers*
*Abdullah Haroon Road*
***KARACHI** 0302*
*Tel: 524131, 524132*
*Telex: 2894 MUSKO PK*
*Cable: COOPERATOR Karachi*
*A,E,M,P**

**PANAMA**
*Electrónico Balboa, S.A.*
*Calle Samuel Lewis, Ed. Alfa*
*Apartado 4929*
***PANAMA 5***
*Tel. 64-2700*
*Telex: 3483 ELECTRON PG*
*A,CM,E,M,P*

# SALES & SUPPORT OFFICES

## Arranged alphabetically by country

### PERU

*Cía Electro Médica S.A.*
*Los Flamencos 145, San Isidro*
*Casilla 1030*
***LIMA** 1*
*Tel: 41-4325, 41-3703*
*Telex: Pub. Booth 25306*
*CM,E,M,P*

### PHILIPPINES

*The Online Advanced Systems Corporation*
*Rico House, Amorsolo Cor. Herrera Street*
*Legaspi Village, Makati*
*P.O. Box 1510*
*Metro **MANILA***
*Tel: 85-35-81, 85-34-91, 85-32-21*
*Telex: 3274 ONLINE*
*A,CH,CS,E,M*

*Electronic Specialists and Proponents Inc.*
*690-B Epifanio de los Santos Avenue*
*Cubao, **QUEZON CITY***
*P.O. Box 2649 Manila*
*Tel: 98-96-81, 98-96-82, 98-96-83*
*Telex: 40018, 42000 ITT GLOBE MACKAY BOOTH*
*P*

### PORTUGAL

*Mundinter*
*Intercambio Mundial de Comércio S.A.R.L.*
*P.O. Box 2761*
*Avenida Antonio Augusto de Aguiar 138*
***P-LISBON***
*Tel: (19) 53-21-31, 53-21-37*
*Telex: 16691 munter p*
*M*

*Soquimica*
*Av. da Liberdade, 220-2*
*1298 **LISBOA** Codex*
*Tel: 56 21 81/2/3*
*Telex: 13316 SABASA*
*P*

*Telectra-Empresa Técnica de Equipmentos Eléctricos S.A.R.L.*
*Rua Rodrigo da Fonseca 103*
*P.O. Box 2531*
***P-LISBON** 1*
*Tel: (19) 68-60-72*
*Telex: 12598*
*CH,CS,E,P*

### PUERTO RICO

Hewlett-Packard Puerto Rico
P.O. Box 4407
**CAROLINA**, Puerto Rico 00628
Calle 272 Edificio 203
Urb. Country Club
**RIO PIEDRAS**, Puerto Rico
Tel: (809) 762-7255
A,CH,CS

### QATAR

*Computearbia*
*P.O. Box 2750*
***DOHA***
*Tel: 883555*
*Telex: 4806 CHPARB*
*P*

*Eastern Technical Services*
*P.O.Box 4747*
***DOHA***
*Tel: 329 993*
*Telex: 4156 EASTEC DH*

*Nasser Trading & Contracting*
*P.O.Box 1563*
***DOHA***
*Tel: 22170, 23539*
*Telex: 4439 NASSER DH*
*M*

### SAUDI ARABIA

*Modern Electronic Establishment*
*Hewlett-Packard Division*
*P.O. Box 281*
*Thuobah*
***AL-KHOBAR***
*Tel: 864-46 78*
*Telex: 671 106 HPMEEK SJ*
*Cable: ELECTA AL-KHOBAR*
*CH,CS,E,M,P*

*Modern Electronic Establishment*
*Hewlett-Packard Division*
*P.O. Box 1228*
*Redec Plaza, 6th Floor*
***JEDDAH***
*Tel: 644 38 48*
*Telex: 4027 12 FARNAS SJ*
*Cable: ELECTA JEDDAH*
*CH,CS,E,M,P*

*Modern Electronic Establishment*
*Hewlett-Packard Division*
*P.O.Box 2728*
***RIYADH***
*Tel: 491-97 15, 491-63 87*
*Telex: 202049 MEERYD SJ*
*CH,CS,E,M,P*

### SCOTLAND

**See United Kingdom**

### SINGAPORE

Hewlett-Packard Singapore (Sales) Pte. Ltd.
P.O. Box 58 Alexandra Post Office
**SINGAPORE**, 9115
6th Floor, Inchcape House
450-452 Alexandra Road
**SINGAPORE** 0511
Tel: 631788
Telex: HPSGSO RS 34209
Cable: HEWPACK, Singapore
A,CH,CS,E,MS,P

*Dynamar International Ltd.*
*Unit 05-11 Block 6*
*Kolam Ayer Industrial Estate*
***SINGAPORE** 1334*
*Tel: 747-6188*
*Telex: RS 26283*
*CM*

### SOUTH AFRICA

Hewlett-Packard So Africa (Pty.) Ltd.
P.O. Box 120
Howard Place **CAPE PROVINCE** 7450
Pine Park Center, Forest Drive, Pinelands
**CAPE PROVINCE** 7405
Tel: 53-7954
Telex: 57-20006
A,CH,CM,E,MS,P

Hewlett-Packard So Africa (Pty.) Ltd.
P.O. Box 37099
92 Overport Drive
**DURBAN** 4067
Tel: 28-4178, 28-4179, 28-4110
Telex: 6-22954
CH,CM

Hewlett-Packard So Africa (Pty.) Ltd.
6 Linton Arcade
511 Cape Road
Linton Grange
**PORT ELIZABETH** 6001
Tel: 041-302148
CH

Hewlett-Packard So Africa (Pty.) Ltd. P.O.Box 33345
Glenstantia 0010 **TRANSVAAL**
1st Floor East
Constantia Park Ridge Shopping Centre
Constantia Park
**PRETORIA**
Tel: 982043
Telex: 32163
CH,E

Hewlett-Packard So Africa (Pty.) Ltd.
Private Bag Wendywood
**SANDTON** 2144
Tel: 802-5111, 802-5125
Telex: 4-20877
Cable: HEWPACK Johannesburg
A,CH,CM,CS,E,MS,P

### SPAIN

Hewlett-Packard Española S.A.
Calle Entenza, 321
**E-BARCELONA** 29
Tel: 322.24.51, 321.73.54
Telex: 52603 hpbee
A,CH,CS,E,MS,P

Hewlett-Packard Española S.A.
Calle San Vicente S/No
Edificio Albia II
**E-BILBAO** 1
Tel: 423.83.06
A,CH,E,MS

Hewlett-Packard Española S.A.
Crta. de la Coruña, Km. 16, 400
Las Rozas
**E-MADRID**
Tel: (1) 637.00.11

CH,CS,M

Hewlett-Packard Española S.A.
Avda. S. Francisco Javier, S/no
Planta 10. Edificio Sevilla 2,
**E-SEVILLA** 5
Tel: 64.44.54
Telex: 72933
A,CS,MS,P

Hewlett-Packard Española S.A.
Calle Ramon Gordillo, 1 (Entlo.3)
**E-VALENCIA** 10
Tel: 361-1354
CH,P

### SWEDEN

Hewlett-Packard Sverige AB
Sunnanvagen 14K
S-22226 **LUND**
Tel: (046) 13-69-79
Telex: (854) 17886 (via Spånga office)
CH

Hewlett-Packard Sverige AB
Vastra Vintergatan 9
S-70344 **OREBRO**
Tel: (19) 10-48-80
Telex: (854) 17886 (via Spånga office)
CH

Hewlett-Packard Sverige AB
Skalholtsgatan 9, Kista
Box 19
S-16393 **SPÅNGA**
Tel: (08) 750-2000
Telex: (854) 17886
A,CH,CM,CS,E,MS,P

Hewlett-Packard Sverige AB
Frötallisgatan 30
S-42132 **VÄSTRA-FRÖLUNDA**
Tel: (031) 49-09-50
Telex: (854) 17886 (via Spånga office)
CH,E,P

### SWITZERLAND

Hewlett-Packard (Schweiz) AG
Clarastrasse 12
CH-4058 **BASLE**
Tel: (61) 33-59-20
A

Hewlett-Packard (Schweiz) AG
7, rue du Bois-du-Lan
Case Postale 365
CH-1217 **MEYRIN** 1
Tel: (0041) 22-83-11-11
Telex:27333 HPAG CH
CH,CM,CS

Hewlett-Packard (Schweiz) AG
Allmend 2
CH-8967 **WIDEN**
Tel: (0041) 57 31 21 11
Telex: 53933 hpag ch
Cable: HPAG CH
A,CH,CM,CS,E,MS,P

### SYRIA

*General Electronic Inc.*
*Nuri Basha P.O. Box 5781*
***DAMASCUS***
*Tel: 33-24-87*
*Telex: 11216 ITIKAL SY*
*Cable: ELECTROBOR DAMASCUS*
*E*

*Middle East Electronics*
*Place Azmé*
*P.O.Box 2308*
***DAMASCUS***
*Tel: 334592*
*Telex: 11304 SATACO SY*
*M,P*

### TAIWAN

Hewlett-Packard Far East Ltd.
Kaohsiung Office
2/F 68-2, Chung Cheng 3rd Road
**KAOHSIUNG**
Tel: 241-2318, 261-3253
CH,CS,E

Hewlett-Packard Far East Ltd.
Taiwan Branch
5th Floor
205 Tun Hwa North Road
**TAIPEI**
Tel: (02) 712-0404
Cable:HEWPACK Taipei
A,CH,CM,CS,E,M,P

*Ing Lih Trading Co.*
*3rd Floor, 7 Jen-Ai Road, Sec. 2*
***TAIPEI 100***
*Tel: (02) 3948191*
*Cable: INGLIH TAIPEI*
M

### THAILAND

*Unimesa*
*30 Patpong Ave., Suriwong*
***BANGKOK** 5*
*Tel: 235-5727*
*Telex: 84439 Simonco TH*
*Cable: UNIMESA Bangkok*
*A,CH,CS,E,M*

*Bangkok Business Equipment L*
*5/5-6 Dejo Road*
***BANGKOK***
*Tel: 234-8670, 234-8671*
*Telex: 87669-BEQUIPT TH*
*Cable: BUSIQUIPT Bangkok*
*P*

### TRINIDAD & TOBAGO

*Caribbean Telecoms Ltd.*
*50/A Jerningham Avenue*
*P.O. Box 732*
***PORT-OF-SPAIN***
*Tel: 62-44213, 62-44214*
*Telex: 235,272 HUGCO WG*
*CM,E,M,P*

### TUNISIA

*Tunisie Electronique*
*31 Avenue de la Liberte*
***TUNIS***
*Tel: 280-144*
*E,P*

*Corema*
*1 ter. Av. de Carthage*
***TUNIS***
*Tel: 253-821*
*Telex: 12319 CABAM TN*
*M*

### TURKEY

*Teknim Company Ltd.*
*Iran Caddesi No. 7*
*Kavaklidere, **ANKARA***
*Tel: 275800*
*Telex: 42155 TKNM TR*
*E*

*E.M.A.*
*Medina Eldem Sokak No.41/6*
*Yuksel Caddesi*
***ANKARA***
*Tel: 175 622*
*M*

### UNITED ARAB EMIRAT

*Emitac Ltd.*
*P.O. Box 1641*
***SHARJAH***
*Tel: 354121, 354123*
*Telex: 68136 Emitac Sh*
*CH,CS,E,M,P*

### UNITED KINGDOM

### GREAT BRITAIN

Hewlett-Packard Ltd.
Trafalgar House
Navigation Road
**ALTRINCHAM**
Chesire WA14 1NU
Tel: (061) 928-6422
Telex: 668068
A,CH,CS,E,M

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March 1983 5952-6900

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64502-90903, SEPTEMBER 1982

# SERVICE MANUAL CHANGES

**MANUAL IDENTIFICATION**

| | |
|---|---|
| **Model Number:** | 64500S |
| **Date Printed:** | October 1982 |
| **Part Number:** | 64500-90910 |

This supplement contains important information for correcting manual errors and for adapting the manual to instruments containing improvements made after the printing of the manual.

To use this supplement:

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Make all appropriate serial number related changes indicated in the tables below.

| Serial Prefix or Number | Make Manual Changes |
|---|---|
| | |
| 2239A | ERRATA |
| | |
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| | |
| | |

| Serial Prefix or Number | Make Manual Changes |
|---|---|
| | |
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| | |
| | |
| | |
| | |

▲ NEW ITEM

ERRATA

Title page,

Change: Change the serial prefix number from 2237A to 2239A.

Section IV,

Page 4-5,

Change: Add ARROWs as shown;

U9=(XXXX)(XXXX)

Bit 7, U9 pin 19 ↑ ↑ Bit 0, U9 PIN 2

U31=(XXXX)(XXXX)

Bit 7, U31 pin 19 ↑ ↑ Bit 0, U31 pin 2

U20=(XXXX)(XXXX)

Bit 7, U20 pin 19 ↑ ↑ Bit 0, U20 pin 2

NOTE

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Page 4-5,
Change. Add ARROWs as shown;

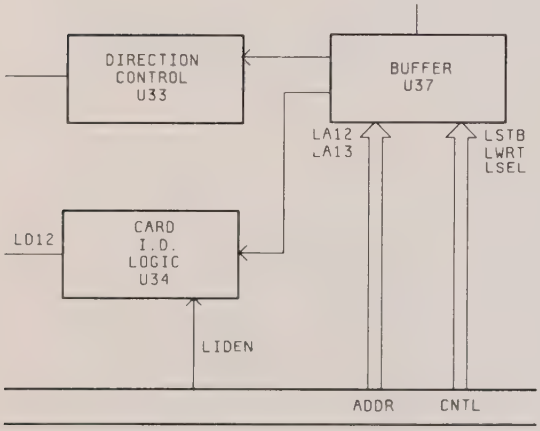
U10=(XXXX)(XXXX)
Bit 7, U10 pin 19 ↑ ↑ Bit 0, U10 pin 2

Section VI,
Page 6-6, table 6-2, Replaceable Parts List,
Change. Change XU33 part number and description to;
******* XU33, 16 Pin Socket, HP Part No. 1200-0607, CD=3
Delete: Lable Warning from parts list.

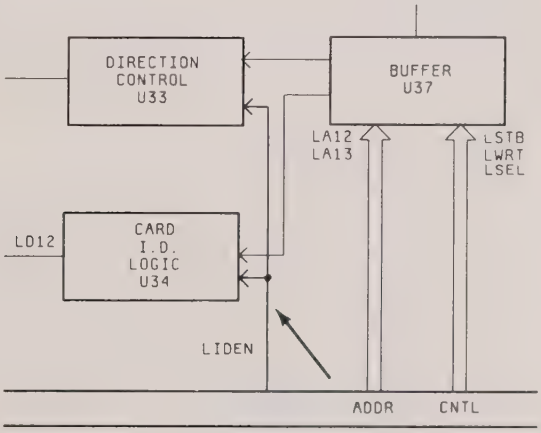
Section VII
Page 7-1, CHANGE 1,
Change: Service Note Number From 65502S-2 to 64500S-2.
Pages 7-2 and 7-4,
Change: The figures 7-2 and 7-3 descriptions are interchanged.

Section VIII,
Page 8-2, Figure 8-1, Block Diagram,
Change: Make changes as shown below to the Block Diagram.

Before:

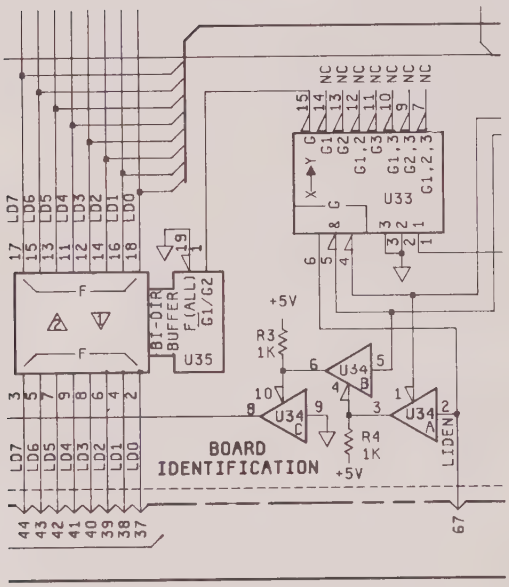



After:

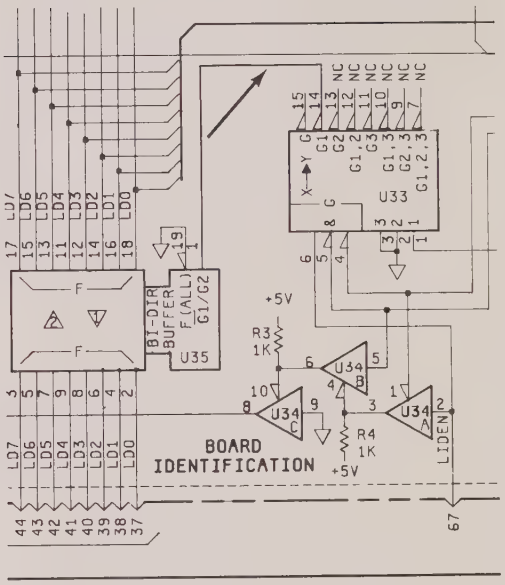


Page 8-11, figure 8-2,
Change: Make changes to the Board ID Logic on the schematic as shown below.

Before:




After:



# SERVICE MANUAL CHANGES

**MANUAL IDENTIFICATION**

| | |
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| Model Number: | 64500S |
| Date Printed: | October 1982 |
| Part Number: | 64500-90910 |

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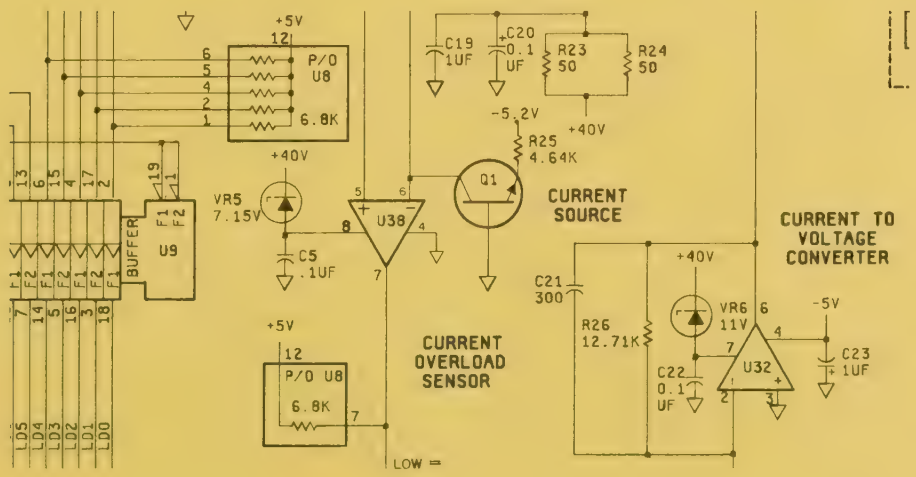
| 2239A | 1 |

| Serial Prefix or Number | Make Manual Changes |
|---|---|
| | |

## CHANGE 1

Page 6-6, Replaceable Parts List,
Change: W1, HP Part No. 8120-3346 to 8120-4336, CD=7.

Page 8-11, Figure 8-2, Prom Programmer Schematic,
Change: Make changes to U38 as shown below.

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("ISSUE A" Change Sheet must also accompany "ISSUE B" Change Sheet)

# SERVICE MANUAL CHANGES

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| | |
|---|---|
| **Model Number:** | 64502A |
| **Date Printed:** | SEPTEMBER 1982 |
| **Part Number:** | 64502-90903 |

This supplement contains important information for correcting manual errors and for adapting the manual to instruments containing improvements made after the printing of the manual.

To use this supplement:

Make all ERRATA corrections.

Make all appropriate serial number related changes indicated in the tables below.

| Serial Prefix or Number | Make Manual Changes |
|---|---|
| NONE | ERRATA |
| | |
| | |
| | |
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| | |

| Serial Prefix or Number | Make Manual Changes |
|---|---|
| | |
| | |
| | |
| | |
| | |

▲ NEW ITEM

ERRATA

Section I,
Page 1-2, Paragraph 1-15,
Add: Add to list of EPROMS the Intel 2758.

Section VI,
Page 6-5, Replaceable Parts List,
Add: C2, .01uF, HP Part No. 0160-4832, CD=4.

Section VIII,
Page 8-3, Grid Locator,
Add: C1, .1uF is on the grid locator at approximately "D4".
Add: C2, .01uF is on back of PC board shown on "sheet A".
Page 8-4.5, Timing Diagrams,
Add: Insert page 8-4.5, Timing Diagram shown on "sheet B".
Page 8-5, Figure 8-2,
Add: C2, .01uF connects from A11, near pin 20 to ground.

NOTE

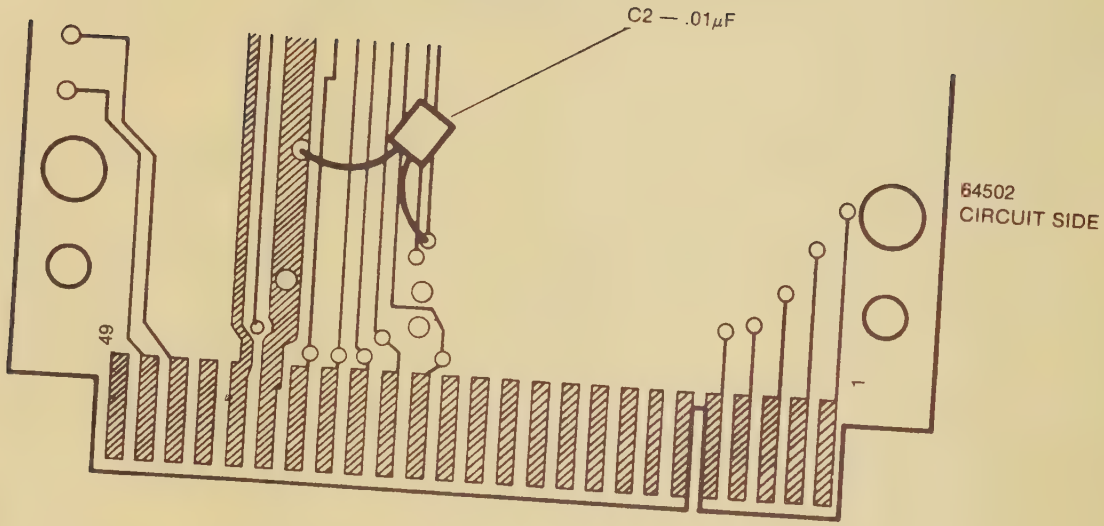
Manual change supplements are revised as often as necessary to keep manuals as current and accurate as possible. Hewlett-Packard recommends that you periodically request the latest edition of this supplement. When requesting copies quote the manual identification information from your supplement, or the model number and print date from the title page of the manual.



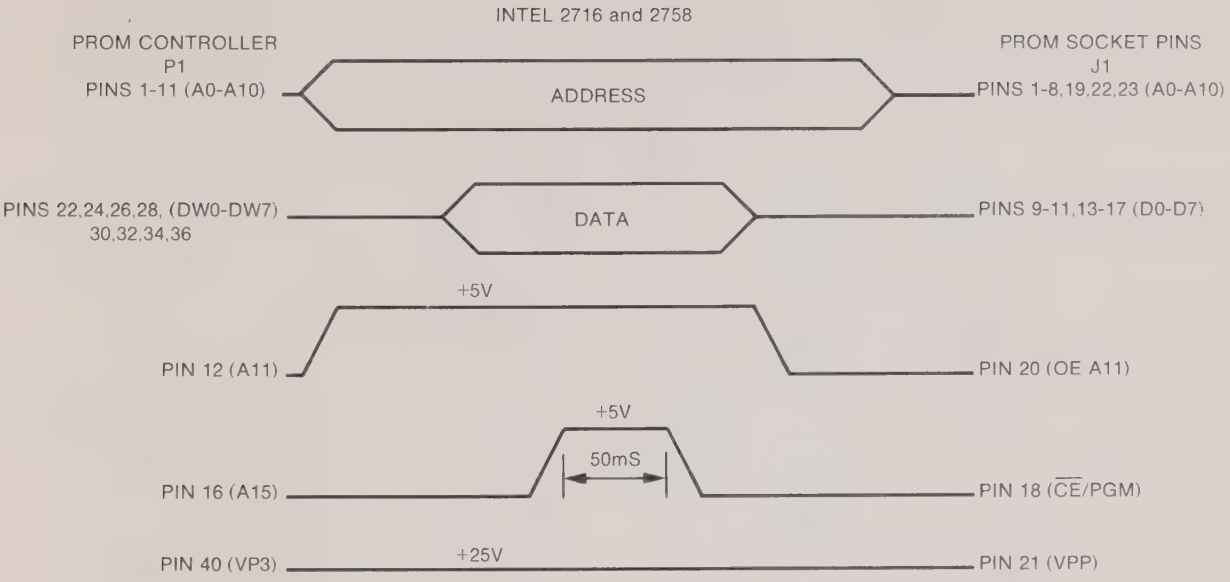
ISSUE A

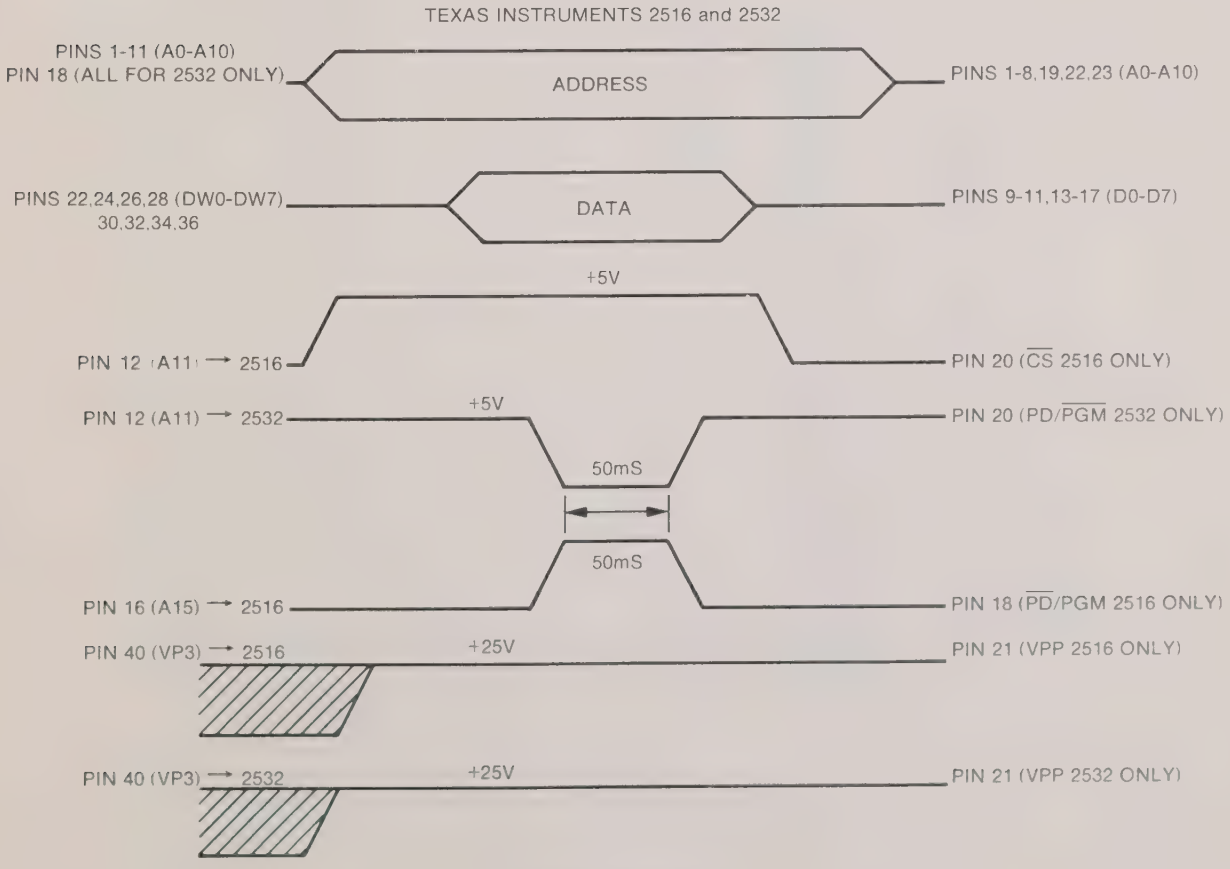
HEWLETT PACKARD

Printed in U.S.A.




Installation of Capacitor. Dress leads with sleeve tubing.




Timing Diagrams

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